XW562K - V650 AND CX650

1   GENERAL WARNING

1.1   ⚠ PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.

1.2   ⚠ SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- Fit the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell S.p.A." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2   GENERAL DESCRIPTION

The **XW562K** series is fitted with a Real Time Clock which allows programming of up to eight daily defrost cycles, divided into holidays and workdays.

Model **XW562K**, **127x123** mm format, is microprocessor based controller suitable for applications on medium or low temperature refrigerating units. It is provided with six relay outputs to control 2 compressors, defrost - which can be either electrical or hot gas - the evaporator fans, the condenser fan and the alarm output. They are also provided with 3 NTC probe inputs, one for temperature control, the other 2 to control the defrost end temperature of the evaporators. There are 3 digital inputs (free contact) for the door switch, the pressure switch and for safety end of defrost.

The electronic controller can work with two parameter lists, switch over by a key.

The standard TTL output allows the user to connect, by means of a TTL/RS485 external module, a **ModBUS-RTU** compatible monitoring system and to programme the parameter list with the **"Hot Key"**.

The controller also provides an output for remote keyboard V650 or CX650.

3   CONTROLLING LOADS

3.1   THE COMPRESSORS

The regulation is performed according to the temperature measured by the thermostat probe with a positive differential from the set point: if the temperature increases and reaches set point plus differential the compressor is started. The compressor is turned off when the temperature reaches the set point value again.

In case of fault in the thermostat probe the start and stop of the compressor are timed through parameters "**COn**" and "**COF**".

3.2   2ND COMPRESSOR MANAGEMENT

The relay of the second compressor is activated in parallel with the relay of the first compressor, with a possible delay set in the **AC1** or **AC2** parameters, depending on program 1 or 2. Both the compressors are switched off at the same time.

3.3   DEFROST

2 defrost modes are available through the "**tdF**" parameter: defrost with electrical heater or hot gas. The defrost interval is control by means the real time clock, depending on the hours set in the parameters **Ld1..Ld8** on workdays and in **Sd1…Sd8** in holidays for program 1, **2L1.. 2L8** on workdays and in **2S1…2S8** in holidays for program 2.

At the end of defrost the drip time is controlled through the "**Fdt**" parameter.

3.4   CONTROL OF EVAPORATOR FANS

The fan control mode is selected by means of the "**FnC**" parameter for program 1 and **Fn2**" parameter for program 2:

C-n fans will switch ON and OFF with the compressor and **not run** during defrost;

C-y fans will switch ON and OFF with the compressor, also during defrost

> After defrost, there is a timed fan delay allowing for drip time, set by means of the "**Fnd**" parameter.

O-n fans will run continuously and **not run** during defrost;

O-y fans will run continuously also during defrost

An additional parameter "**FSt**" provides the setting of temperature, detected by the evaporator probe, above which the fans are always OFF. This can be used to make sure circulation of air only if his temperature is lower than set in "FSt".

3.5   CONTROL OF CONDENSER FAN

The condenser fan relay is always activated except during defrost. During the defrost the status of condenser fan depends on the **cFE** parameter:

with **cFE= no** the condenser fan **doesn't run** during defrost

with **cFE= yES** the condenser fan **runs** during defrost

4   KEYBOARD

set	To display and modify target set point; in programming mode it selects a parameter or confirms an operation. By pressing it when the current time is displayed, it allows the User to re-set the current time and three holidays.
▲	In programming mode it browses the parameter codes or increases the displayed value.
▼	in programming mode it browses the parameter codes or decreases the displayed value. By holding it pressed for 3s the current time is displayed and it permits the User to enter, Defrost and Clock parameter menu.
❄	By holding it pressed for 3s the defrost is started. The manual defrost overrides the minimum running time of a compressor ("on" parameter) By pressing it when the current time is displayed, it allows the User to set defrost times.
***	**Prg1** Keep it pressed for 2 seconds to switch the controller from the Program 2 to the Program 1.
*	**Prg2** Keep it pressed for 2 seconds to switch the controller from the Program 1 to the Program 2.

KEY COMBINATIONS

▲ + ▼	To lock and unlock the keyboard.
set + ▼	To enter the programming mode.
set + ▲	To exit the programming mode.

4.1   USE OF LEDS

Each LED function is described in the following table.

LED	MODE	Function
❄₁	ON	The compressor 1 is running
❄₁	FLASHING	- Programming Phase (flashing with ❄) - Anti-short cycle delay enabled
❄	ON	The defrost is enabled
❄	FLASHING	Programming Phase (flashing with ❄₁) Drip time in progress
✿	ON	The evaporator fan is running
✿	FLASHING	The evaporator fan delay after defrost is running
❄₂	ON	The compressor 2 is running
❄₂	FLASHING	The second compressor delay is running
((·))	ON	Alarm is happening
☉	ON	Condenser fan is running
***	ON	Prg1 is running
★	ON	Prg2 is running

Function of the LEDs placed on the left top side of buttons (V650):

BUTTON	MODE	FUNCTION
Prg1	ON	Prg1 is running
Prg2	ON	Prg2 is running

4.2   HOW TO SEE AND MODIFY THE SET POINT

1. Push for 2sec the **SET** key: the display will show the Set point value;
2. To change the Set value push the **o** or **n** arrows within 10s.
3. To memorise the new set point value push the **SET** key again or wait 10s.

4.3   TO START A MANUAL DEFROST

Push the **DEF** key for more than 2 seconds and a manual defrost will start. Manually defrost has higher priority than min. compressor running time (on-parameter).

4.4   TO ENTER IN PARAMETERS LIST

To enter the parameter list (user accessible parameters) operate as follows:

1. Enter the Programming mode by pressing the Set and DOWN key for 5s (Pr2 appears)
2. Release the keys ❄ and ❄ start blinking
3. Select the required parameter.
4. Press the "**SET**" key to display its value .
5. Use "**UP**" or "**DOWN**" to change its value.
6. Press "**SET**" to store the new value and move to the following parameter.
To exit: Press **SET + UP** or wait 30s without pressing a key.
NOTE: the set value is stored even when the procedure is exited by waiting the time-out to expire.

4.5   HOW TO CHANGE THE PARAMETER VALUE

1. Enter the Programming mode.
2. Select the required parameter with **o** or **n**.
3. Press the "**SET**" key to display its value (❄ and ❄ LED starts blinking).
4. Use **o** or **n** to change its value.
5. Press "**SET**" to store the new value and move to the following parameter.
To exit: Press **SET + UP** or wait 15s without pressing a key.
NOTE: the new programming is stored even when the procedure is exited by waiting the time-out.

4.6   HOW TO LOCK THE KEYBOARD

1. Keep the **o** and **n** keys pressed together for more than 3 s the **o** and **n** keys.
2. The "POF" message will be displayed and the keyboard is locked. At this point it is only possible the viewing of the set point or the MAX o Min temperature stored and to switch ON and OFF the light, the auxiliary output and the instrument.

TO UNLOCK THE KEYBOARD

Keep the **o** and **n** keys pressed together for more than 3s.

4.7   TO SEE THE PROBE VALUES

1. Enter in "**Pr2**" level.
2. Select "**Prd**" parameter with **o** or **n**.
3. Press the "**SET**" key to display "**Pb1**" label alternate with Pb1 value.
4. Use **o** and **n** keys to display the other probe values.
5. Press "**SET**" to move to the following parameter.

5   REAL TIME CLOCK FUNCTIONS

5.1   TO SEE AND SET THE CURRENT TIME AND DAY

1. Push the **DOWN** key for more than 3 seconds
2. The following messages are displayed in sequence:
   Hur (hour) followed by the hour;
   Min (Minute) followed by the minutes
   dAY (day) followed by the day of the week
3. By pushing the SET key, the setting of current hour, minutes, day will be possible
4. To exit: push **SET+ UP** key or wait 15 seconds

5.2   TO SET THE DEFROST TIMES

1. Push the **DOWN** key for more than 3 seconds
2. The current time is displayed as written above
3. By pushing **DEF** key, the setting defrost time will be possible.
4. To exit, press **SET + UP** or wait 15s without pressing any key.

5.3   STAND BY FUNCTION

1. Enter the programming.
2. Select the **onF** parameter

3. Change its value from "no" to "yES".
4. Exit the programming and the instrument will be palced in stanby mode.

To revert to the normal working push for some seconds the SET key.

6   PARAMETER LIST

REGULATION

Set1   Set point 1 (LS÷US) Is the target set point 1
Set2   Set point 2 (LS2÷US2) Is the target set point 2
Hy Differential for the set1: (0,1÷25,5℃; 1÷45℉): Intervention differential for set point1, always positive. Compressor Cut IN is Set Point Plus Differential (Hy). Compressor Cut OUT is when the temperature reaches the set point.
Hy2 Differential for the set2: (0,1÷25,5℃; 1÷45℉): Intervention differential for set point2, always positive. Compressor Cut IN is Set Point Plus Differential (Hy). Compressor Cut OUT is when the temperature reaches the set point.
LS Minimum set point 1 limit: (-50,0℃÷SET1; -58℉÷SET1) Sets the minimum acceptable value for the set point1.
US Maximum set point 1 limit: (SET1÷110℃; SET1÷230℉) Set the maximum acceptable value for set point1.
LS2 Minimum set point 2 limit: (-50,0℃÷SET2; -58℉÷SET2) Sets the minimum acceptable value for the set point2.
US2 Maximum set point 2 limit: (SET2÷110℃; SET2÷230℉) Set the maximum acceptable value for set point2.
odS Outputs activation delay at start up: (0÷255 min) This function is enabled at the initial start up of the instrument and inhibits any output activation for the period of time set in the parameter. (AUX and Light can work)
AC Anti-short cycle delay: (0÷30 min) interval between the compressor stop and the following restart.
AC1 2nd compressor delay at start up, program 1 (0÷255sec) Time interval between the switching on of the first compressor and the second one.
AC2 2nd compressor delay at start up, program 2 (0÷255sec) Time interval between the switching on of the first compressor and the second one.
on minimum compressor running time (0÷30min)
Mon Maximum compressor running time (0÷120min, with 0 the function is disabled) If this time is reached the compressor is switched off for the Ac time, then if there are the conditions it restarts.
cP2 Second compressor enabled with program 2 (yES, no)
Con Compressor ON time with faulty probe: (0÷255 min) time during which the compressor is active in case of faulty thermostat probe. With COn=0 compressor is always OFF.
COF Compressor OFF time with faulty probe: (0÷255 min) time during which the compressor is off in case of faulty thermostat probe. With COF=0 compressor is always active.
S2E Second program enabled: no=the second set point is disabled and not selectable; **yES =** the second set point can be selected.

DISPLAY

CF Temperature measurement unit: ℃ = Celsius; ℉ = Fahrenheit . When the measurement unit is changed the SET point and the values of the regulation parameters have to be modified
rES Resolution (for ℃): (in = 1℃; de = 0,1℃) allows decimal point display.
   dE = 0,1℃; **in** = 1 ℃
dot Display offset for program 1: (0÷25.5 ℃) it is used for the special visualisation LINDE's algorithm.
do2 Display offset for program 2: (0÷25.5 ℃) it is used for the special visualisation LINDE's algorithm.
dHy Display histeresys: (0÷25.5 ℃) it is used for the special visualisation LINDE's algorithm.   When the temperature measured by the room probe is less then Setpoint + Hysteresis, the displayed temperature must be calculated by the microprocessor according to the following formula:

if **Tm** > SEt + Hy ->   **Td** = SEt + dot + dHy
if **Tm** ≤ SEt + Hy   ->   **Td** = (SEt + dot) + {[(Tm – SEt) x dHy] / Hy }

where **Tm** = temperature measured by room probe
   Td = temperature displayed by the controller

DEFROST

MdF enabling the defrost key: **yES**= defrost key enabled;
   no = defrost key disabled.
tdF Defrost type: rE = electrical heater (Compressor OFF)
   in = hot gas (Compressor and defrost relays ON)
EdF Defrost mode:
   rtc = **Real Time Clock mode**. Defrost time follows **Ld1÷Ld8** parameters on workdays and **Sd1÷Sd8** on holidays for program 1, **2L1÷2L8** parameters on workdays and **2S1÷2S8** on holidays for program 1
   in = **interval mode**. The defrost starts when the time "**Idf**" is expired.
dtE Defrost termination temperature fro program 1: (-50,0÷110,0℃; -58÷230℉) (Enabled only when the evaporator probe is present) sets the temperature measured by the evaporator probe which causes the end of defrost.
dt2 Defrost termination temperature fro program 2: (-50,0÷110,0℃; -58÷230℉) (Enabled only when the evaporator probe is present) sets the temperature measured by the evaporator probe which causes the end of defrost.
IdF Interval between defrosts for program 1: (1÷120h) It is used as safety time in case of RTC problem. Determines the time interval between the beginning of two defrost cycles, when the RTC is broken.
Id2 Interval between defrosts for program 2: (1÷120h) It is used as safety time in case of RTC problem. Determines the time interval between the beginning of two defrost cycles, when the RTC is broken.
Mtd (Maximum) duration of defrost for program 1: (0÷255 min) When **P2P = n**, no evaporator probe, it sets the defrost duration, when **P2P = y**, defrost end based on temperature, it sets the maximum length for defrost.

Mt2 (Maximum) duration of defrost for program 2: (0÷255 min) When **P2P = n**, no evaporator probe, it sets the defrost duration, when **P2P = y**, defrost end based on temperature, it sets the maximum length for defrost.

dFd Display during defrost: **dEF** = "dEF" label;   **dEG** = "dEG" label;

dSd Start defrost delay:(0÷59min) This is useful when different defrost start times are necessary to avoid overloading the plant.

Fdt Drain down time: (0÷60 min.) time interval between reaching defrost termination temperature and the restoring of the control's normal operation. This time allows the evaporator to eliminate water drops that might have formed due to defrost.

dPO First defrost after start-up: **y** = Immediately; **n** = after the IdF time

cFE Condenser fan working during defrost : no = condenser fan doesn't run during defrost; **yES** = condenser fan runs during defrost

EVAPORATOR FANS

FnC Fan operating mode for program 1:
C-n = running with the compressor, OFF during the defrost;
C-y = running with the compressor, ON during the defrost;
O-n = continuous mode, OFF during the defrost;
O-y = continuous mode, ON during the defrost;

FC2 Fan operating mode for program 2:
C-n = running with the compressor, OFF during the defrost;
C-y = running with the compressor, ON during the defrost;
O-n = continuous mode, OFF during the defrost;
O-y = continuous mode, ON during the defrost;

Fnd Fan delay after defrost: (0÷255 min) The time interval between the defrost end and evaporator fans start.

FSt Fan stop temperature: (-50÷110℃; -58÷230℉) setting of temperature, detected by evaporator probe, above which the fan is always OFF.

ALARMS

ALU High temperature alarm setting related to the SET1: (-50 ÷ 150℃) when this temperature is reached and after the ALd delay time the tAL alarm is enabled.

Au2 High temperature alarm setting related to the SET2: (-50 ÷ 150℃) when this temperature is reached and after the ALd delay time the tAL alarm is enabled.

ALd Temperature alarm delay: (0÷255 min) time interval between the detection of an alarm condition and the corresponding alarm signalling.

dAO Exclusion of temperature alarm at start-up or after a defrost: (from 0.0 min to 23.5h) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

tbA Alarm relay muting: (**no** = muting disabled: the alarm relay is active till the alarm condition lasts, **yES** = muting enabled: the alarm relay can be muting by pressing a key.

oAP Alarm relay polarity: CL = contact 63-64 are closed when an alarm happens. **oP** = contact 63-65 are closed when an alarm happens.

ArE Alarm relay activated by first digital input (door switch):
(**no** = the digital input doesn't activate the alarm relay; **yES** = the digital input activates the alarm relay)

PROBE INPUTS

Ot Thermostat probe calibration: (-12.0÷12.0℃/ -21÷21℉) allows to adjust possible offset of the thermostat probe.

P2P Evaporator probe presence: no= not present: the defrost stops only by time; **yES**= present: the defrost stops by temperature and time.

OE Evaporator probe calibration: (-12.0÷12.0℃/ -21÷21℉) allows to adjust possible offsets of the evaporator probe.

P3P Second evaporator probe presence: no= not present: the defrost stops only by time; **yES**= present: the defrost stops by temperature and time.

O3 Second Evaporator probe calibration: (-12.0÷12.0℃/ -21÷21℉) allows to adjust possible offsets of the evaporator probe.

DIGITAL INPUTS

i1P Door switch input polarity: CL : the digital input is activated by closing the contact; **OP** : the digital input is activated by opening the contact.

i2P Pressure switch digital input polarity:
CL : the digital input is activated by closing the contact;
OP : the digital input is activated by opening the contact

i3P Digital input polarity of the safety thermostat for defrost:
CL : the digital input is activated by closing the contact;
OP : the digital input is activated by opening the contact

did Time interval delay for the first digital input (door switch):(0÷255 min.) "did" parameter defines the time delay between the detection and the successive signalling of the alarm at first digital input.

TO SET CURRENT TIME AND WEEKLY HOLIDAYS (3SEC. ⌚ afterward ⚙)

Hur Current hour (0 ÷ 23 h)
Min Current minute (0 ÷ 59min)
dAY Current day (Sun ÷ SAt)
Hd1 First weekly holiday (Sun ÷ nu) Set the first day of the week which follows the holiday times.
Hd2 Second weekly holiday (Sun ÷ nu) Set the second day of the week which follows the holiday times.
Hd3 Third weekly holiday (Sun ÷ nu) Set the third day of the week which follows the holiday times.
    N.B. Hd1,Hd2,Hd3 can be set also as **"nu"** value (Not Used)

TO SET DEFROST TIMES (3SEC. ⌚ afterward ❄)

Ld1÷Ld8 Workday defrost start for program 1 (0 ÷ 23h 50 min.) These parameters set the beginning of the eight programmable defrost cycles during workdays. Ex. When **Ld2** = 12.4 the second defrost starts at 12.40 during workdays.

Sd1÷Sd8 Holiday defrost start for program 1 (0 ÷ 23h 50 min.) These parameters set the beginning of the eight programmable defrost cycles on holidays. Ex. When **Sd2** = 3.4 the second defrost starts at 3.40 on holidays.

N.B. : To disable a defrost cycle set it to "nu"(not used).
Ex. If Ld6=nu ; the sixth defrost cycle is disabled

2L1÷2L8 Workday defrost start for program 2 (0 ÷ 23h 50 min.) These parameters set the beginning of the eight programmable defrost cycles during workdays. Ex. When **2L2** = 12.4 the second defrost starts at 12.40 during workdays.

2S1÷2S8 Holiday defrost start for program 2 (0 ÷ 23h 50 min.) These parameters set the beginning of the eight programmable defrost cycles on holidays. Ex. When **2S2** = 3.4 the second defrost starts at 3.40 on holidays.

OTHER

Adr RS485 serial address (1÷247)**:** Identifies the instrument address when connected to a ModBUS compatible monitoring system.

onF To put in stand by the instrument: no= instrument is working. **yES =** instrument is placed in standby mode.
NOTE1: changing this parameter the instrument is placed in STANDBY mode when the programming is exited.
NOTE: to revert the instrument from stand by the standard working press for some seconds the SET key.*

rEL Release software: (read only) Software version of the microprocessor.

Ptb Parameter table: (read only) it shows the original code of the dIXEL parameter map.

Prd Probes display: (read only) display the temperature values of the evaporator probe Pb2 and the auxiliary probe Pb3.

7 DIGITAL INPUTS

The XW562K can support 3 free contact digital inputs.
The function of each one are described below.

7.1 DOOR SWITCH (TERMINALS 69-70)

The digital input should be activated by closing the contact. The external alarm can be delayed by means of the **did** parameter.
The recovery of this alarm type on the display is „**EA**". By means of the **ArE** parameter can be chosen, either if there is the message „EA" on the display and the alarm relay is activated or if there is only the message „EA" on the display.
The alarm condition disappears as soon as the digital input is open.
The polarity of this digital input is set in the **i1P** parameter.

7.2 PRESSURE SWITCH INPUT (TERMINALS 68-71)

When the pressure switch is activated the compressors are immediately stopped and the "PAL" message is displayed. The alarm relay is always activated.
Condenser fans and evaporator fans continue working.
If the pressure switch is activated during a hot gas defrost, the defrost is stopped.
Standard regulation will restart 6min after the end of High pressure switch alarm.
The polarity of this digital input is set in the **i2P** parameter.

7.3 SAFETY THERMOSTAT FOR DEFROST (TERMINALS 67-72)

When this digital input is activated, the controller finishes the defrost immediately and goes to cooling operation.
The safety thermostat alarm is excluded for the dAo time when the instrument is switched on.
The "**dEA**" alarm message is displayed and the alarm relay is activated.
The next defrost starts at the next programmed defrost time, if the digital input is de-activated.
The polarity of this digital input is set in the **i3P** parameter.

8 INSTALLATION AND MOUNTING

Keyboard **V650** shall be mounted on vertical panel, in a 72x56 mm hole, and fixed using screws ∅ 3 x 2mm. To obtain an IP65 protection grade use the front panel rubber gasket (mod. RGW-V).
Keyboard **CX650** shall be mounted on vertical panel, in a 29x71 mm hole, and fixed using the special bracket supplied.
Power module **XW562K** shall be mounted in a panel with two or more screws and it must be connected to the keyboard by means of a two-wire cable (∅ 1mm). The temperature range allowed for correct operation is 0 - 60 ℃. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes. Let the air circulate by the cooling holes.

8.1 V650: CUT OUT
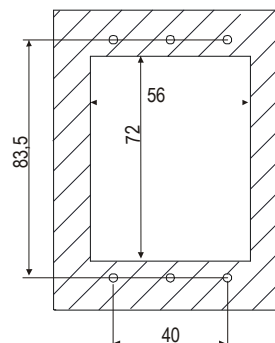
9 ELECTRICAL CONNECTIONS

The instruments are provided with screw terminal block to connect cables with a cross section up to 2,5 mm^2 for the digital and analogue inputs. Relays and power supply

have a Faston connection (6,3mm). Heat-resistant cables have to be used. Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.
N.B. Maximum current allowed for all the loads is 20A.

9.1   PROBE CONNECTIONS

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place the thermostat probe away from air streams to correctly measure the average room temperature. Place the defrost termination probe among the evaporator fins in the coldest place, where most ice is formed, far from heaters or from the warmest place during defrost, to prevent premature defrost termination.

10   TTL SERIAL LINE

The TTL connector allows, by means of the external module TTL/RS485, to connect the unit to a network line **ModBUS-RTU** compatible as the dIXEL monitoring system XJ500 (Version 3.0). The same TTL connector is used to upload and download the parameter list of the "**HOT KEY**". These instruments can be ordered with direct serial output **RS485** (Optional).

11   USE OF THE PROGRAMMING "HOT KEY "

The Wing units can UPLOAD or DOWNLOAD the parameter list from its own E2 internal memory to the "**Hot Key**" and vice-versa.

11.1   DOWNLOAD (FROM THE "HOT KEY" TO THE INSTRUMENT)

1. Turn OFF the instrument by means of the ON/OFF key, remove the TTL serial cable if present, insert the "**Hot Key**" and then turn the Wing ON.
2. Automatically the parameter list of the "**Hot Key**" is downloaded into the Wing memory, the "**DoL**" message is blinking. After 10 seconds the instrument will restart working with the new parameters.
3. Turn OFF the instrument remove the "**Hot Key**", plug in the TTL serial cable, then turn it ON again.
At the end of the data transfer phase the instrument displays the following messages:
"**end** " for right programming. The instrument starts regularly with the new programming.
"**err**" for failed programming. In this case turn the unit off and then on if you want to restart the download again or remove the "**Hot key**" to abort the operation.

11.2   UPLOAD (FROM THE INSTRUMENT TO THE "HOT KEY")

1. Turn OFF the instrument by means of the ON/OFF key and remove the TTL serial cable if present; then turn it ON again.
2. When the Wing unit is ON, insert the "**Hot key**" and push **O** key; the **"uPL"** message appears.
3. Push "**SET"** key to start the UPLOAD; the "**uPL**" message is blinking.
4. Turn OFF the instrument remove the "**Hot Key**", plug in the TTL serial cable, then turn it ON again.
At the end of the data transfer phase the instrument displays the following messages:
"**end** " for right programming.
"**err**" for failed programming. In this case push "SET" key if you want to restart the programming again or remove the not programmed "**Hot key**".

12   ALARM SIGNALS

Message	Cause	Outputs
"P1"	Thermostat probe failure	Alarm output ON; Compressor output according to parameters "COn" and "COF"
"P2"	Evaporator probe failure	Alarm output ON; Defrost ended by time
"P3"	Second evaporator probe failure	Alarm output ON; Defrost ended by time
"tAL"	Max. temperature alarm	Alarm output ON; Other outputs unchanged
"EA"	Digital input 1 activated: external alarm	Alarm relay depends on the ArE par. Output unchanged.
"PAL"	Pressure switch alarm	Compressors off Alarm relay on
"dEA"	Safety thermostat for defrost alarm	Defrost stopped. Alarm relay on. Start cooling
„COO"	Cooling down	-
„DEF"	Defrost is running	-
„POF"*	Keyboard locked	-
"rtc"	Real time clock alarm	Alarm output ON; Other outputs unchanged; Defrosts according to par. "**IdF**" To erase the alarm enter the Clock setting menu by pushing the DOWN key for few second, see. par. 5.2

The alarm message is displayed until the alarm condition is recovery.
All the alarm messages are showed alternatively.

12.1   SILENCING BUZZER / ALARM RELAY OUTPUT

If "**tbA = yES**", once the alarm signal is detected the buzzer and the relay are is silenced by pressing any key.
If "**tbA = no**", only the buzzer is silenced while the alarm relay is on until the alarm condition recovers.

12.2   ALARM RECOVERY

Probe alarms : "P1" (probe1 faulty), "P2" and "P3" automatically stop 10s after the probe restarts normal operation. Check connections before replacing the probe.
Temperature alarms "tAL" automatically stop as soon as the thermostat temperature returns to normal values.
Temperature alarm "tAL" automatically stops as soon as the thermostat temperature returns to normal values and when defrost is started.
Alarms "**EA", "PAL"** and "**dEA"** recover as soon as the digital input is disabled.

13   TECHNICAL DATA

V650 keyboard
Housing: self extinguishing ABS.
Case: V650 facia 64x164 mm; depth 23mm
Mounting:
   V650: panel mounting in a 56x72 mm panel cut-out with two screws. ∅ 3x2mm. Distance between the holes 40mm
Protection: IP20; **Frontal protection:** IP65
Power supply: from **XW562K** power module
Display: 3 digits, red LED, 14,2 mm high;
Optional output: buzzer

CX650 keyboard
Housing: self extinguishing ABS.
Case: CX**650** facia 35x77 mm; depth 23mm
Mounting: panel mounting in a 29x71 mm panel cut-out
Protection: IP20; **Frontal protection:** IP65
Power supply: from **XW562K** power module
Display: 3 digits, red LED, 14,2 mm high;
Optional output: buzzer

XW562K main board
Housing: self extinguishing ABS.
Mounting: by screw
Protection: IP20.
Frontal protection: IP65 with frontal gasket mod RG-L. (optional)
Connections: Screw terminal block ≤ 2,5 mm^2 heat-resistant wiring and tab terminal 6,3x0,8mm for load and supply and tab terminal 6,3x0,8mm for digital inputs and probes
Power supply: 230Vac or. 110Vac ± 10%
Rated impulsive voltage: 2500V
Overvoltage Category: II
Power absorption: 7VA max.
Inputs: 3 NTC probes
Digital inputs: 2 free voltage
Relay outputs: *Total current on loads MAX. 20A*
   compressor 1&2 : relay SPST 20(8) A, 250Vac
   evaporator fans: relay SPST 8(3) A, 250Vac
   defrost: relay SPST 8A, 250Vac
   alarm: SPDT relay 8(3) A, 250Vac
   condenser fans: SPST relay 8(3) A, 250Vac
Serial output : TTL standard
Communication protocol: Modbus - RTU
Data storing: on the non-volatile memory (EEPROM).
Kind of action: 1B.
Pollution degree: 2
Software class: A.
Operating temperature: 0÷50 ℃.
Storage temperature: -25÷60 ℃.
Relative humidity: 20÷85% (no condensing)
Measuring and regulation range: NTC probe: -40÷110℃ (-58÷230℉)

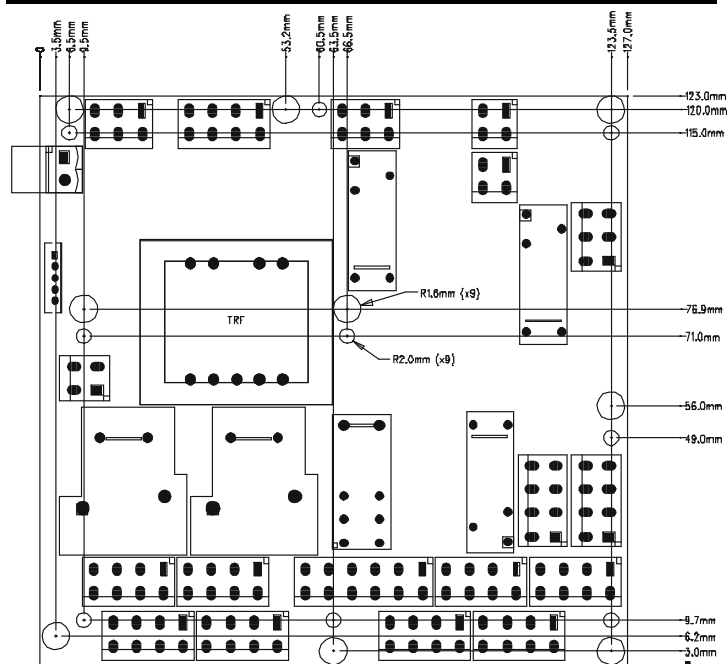**ADDITIONAL INFORMATION, FURNISHED BY MANUFACTURER**
Frontal protection: IP65 with frontal gasket mod RGW-V. (optional)
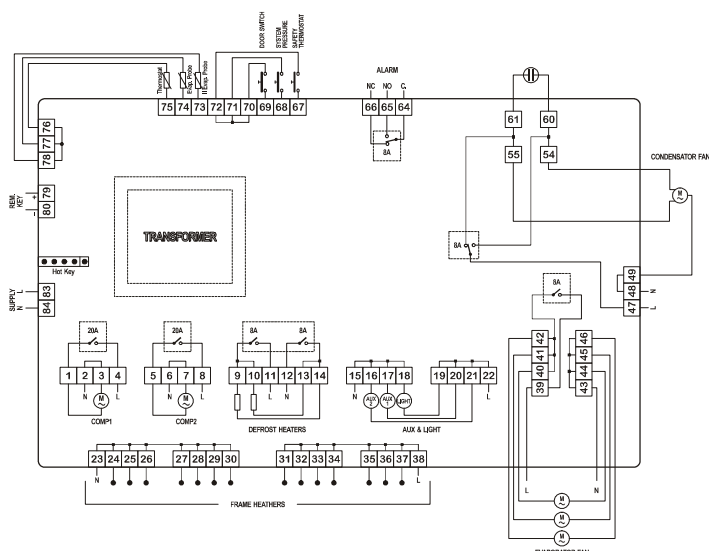**Accuracy (ambient temp. 25℃)**: ±0,5 ℃ ±1 digit
Internal clock back-up: 5 years
Resolution: 0,1 ℃ or 1℃ or 1 ℉ (selectable).

14   DIMENSIONS

15   CONNECTIONS

16   DEFAULT SETTING VALUES

Label	Name	Range	Default
	REGULATION		
Set1	Set point1	LS÷US	40,0
Set2	Set point2	LS2÷US2	40,0
Hy	Differential for set1	0,1÷25,5 °C	2,0
Hy2	Differential for set2	0,1÷25,5 °C	2,0
LS	Minimum set point1	-50,0°C÷SET1	-40,0
US	Maximum set point1	SET1 ÷ 110°C	50,0
LS2	Minimum set point2	-50,0°C÷SET2	-40,0
US2	Maximum set point2	SET2 ÷ 110°C	60,0
OdS	Outputs activation delay at start up	0÷255 min.	0
AC	Anti-short cycle delay	0÷30 min.	3
AC1	Second compressor start delay	0÷255s	10
Ac2	Second compressor start delay progr.2	0 ÷ 255s	10
on	Minimum time a compressor remains on (it's used both for compr. 1 and 2)	0÷30 minutes	5
Mon	Maximum time compressor is continuously on (permanent run monitoring)	0÷120min	0
cP2	Compressor 2 enabled with program 2	y = yES; n = no	yES
COn	Compressor ON time with faulty probe	0÷255 min.	15
COF	Compressor OFF time with faulty probe	0÷255 min.	30
S2F	Second set point enabling	yES÷no	yES
	DISPLAY		
CF	Temperature measurement unit	°C ÷ °F	°C

Label	Name	Range	Default
rES	Resolution (integer/decimal point)	in ÷ dE	dE
dot	Display offset, program 1	0÷25.5 °C	2.0
do2	Display offset, program 2	0÷25.5 °C	2.0
dHy	Display histeresys	0÷25.5 °C	2.0
	DEFROST		
MdF	Defrost key enabling	yES= enabled no= disabled	YES
tdF	Defrost type	rE, in	rE
EdF	Kind of defrost	rtc, in	rtc
dtE	Defrost termination temperature (1°Evaporator)	-50,0÷110°C	8,0
dt2	Defrost termination temperature for program 2	-50.0°C o –58°F ÷ 110°C o 230°F	8,0
IdF	Interval between defrost cycles	1÷120h	12
id2	Interval between defrost cycles for the program 2	1 ÷ 120 hours	12
Mtd	(Maximum) length for 1° defrost	0÷255 min.	30
Mt2	(Maximum) length of defrost for the program 2	0 ÷ 255 minuts	30
dFd	Display during defrost	dEG; dEF	dEF
dSd	Defrost delay	0÷255min	0
Fdt	Draining time	0÷60 min.	0
dPO	First defrost after start up	n ÷ y	no
	FANS		
CFE	Condenser fan working during defrost	yES÷no	YES
FnC	Fans operating mode	C-n, C-y, O-n, O-y	o-n
Fc2	Fans operating mode with program 2	c_n / c_Y / o_n / o_Y	o-n
Fnd	Fans delay after defrost	0÷255 min.	0
FSt	Fans stop temperature	-50,0÷110°C	2.0
	ALARMS		
ALU	MAXIMUM temperature alarm for set1	-50,0÷110°C	50.0
Au2	MAXIMUM temperature alarm for set2	-50,0÷110°C	50.0
ALd	Temperature alarm delay	0÷255 min.	15
dAO	Delay of temperature alarm at start up	0 ÷ 23h 50 min.	1,3
tBA	Alarm relay silencing	yES÷no	no
oAP	Alarm relay polarity	oP, cL	oP
ArE	Digital input 1 actives the alarm relay	yES÷no	no
	ANALOGUE INPUTS		
Ot	Thermostat probe calibration	-12,0÷12,0°C	0.0
P2P	Evaporator probe presence	no ÷ yES	yES
OE	Evaporator probe calibration	-12,0÷12,0°C	0.0
P3P	Second evaporator probe presence	no ÷ yES	no
O3	Second evaporator probe calibration	-12,0÷12,0°C	0.0
	DIGITAL INPUTS		
I1P	Door switch polarity	CL÷OP	cL
I2P	Pressure switch digital input polarity	CL÷OP	oP
I3P	Defrost end digital input polarity	CL÷OP	oP
dId	Digital input alarm delay	0÷255 min.	0

Label	Name	Range	Default
	TIME AND WEEKLY HOLIDAYS		
Hur	Current hour	0 ÷ 23	- - -
Min	Current minute	0 ÷ 59	- - -
dAY	Current day	Sun ÷ SAt	- - -
Hd1	First weekly holiday	Sun÷ SAt – nu	nu
Hd2	Second weekly holiday	Sun÷ SAt – nu	nu
Hd3	Third weekly holiday	Sun÷ SAt – nu	nu
	DEFROST TIMES		
Ld1	1st workdays defrost start	0 ÷ 23h 50 min. - nu	3,0
Ld2	2nd workdays defrost start	0 ÷ 23h 50 min. - nu	nu
Ld3	3rd workdays defrost start	0 ÷ 23h 50 min. - nu	nu
Ld4	4th workdays defrost start	0 ÷ 23h 50 min. - nu	nu
Ld5	5th workdays defrost start	0 ÷ 23h 50 min. - nu	nu
Ld6	6th workdays defrost start	0 ÷ 23h 50 min. - nu	nu
Ld7	7th workdays defrost start	0 ÷ 23h 50 min. - nu	nu
Ld8	8th workdays defrost start	0 ÷ 23h 50 min. - nu	nu
Sd1	1st holiday defrost start	0 ÷ 23h 50 min. - nu	nu
Sd2	2nd holiday defrost start	0 ÷ 23h 50 min. - nu	nu
Sd3	3rd holiday defrost start	0 ÷ 23h 50 min. - nu	nu
Sd4	4th holiday defrost start	0 ÷ 23h 50 min. - nu	nu
Sd5	5th holiday defrost start	0 ÷ 23h 50 min. - nu	nu
Sd6	6th holiday defrost start	0 ÷ 23h 50 min. - nu	nu
Sd7	7th holiday defrost start	0 ÷ 23h 50 min. - nu	nu
Sd8	8th holiday defrost start	0 ÷ 23h 50 min. - nu	nu
2L1	1st workdays defrost start program 2	0 ÷ 23h 50 min. - nu	7,0
2L2	2nd workdays defrost start program 2	0 ÷ 23h 50 min. - nu	19,0
2L3	3rd workdays defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2L4	4th workdays defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2L5	5th workdays defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2L6	6th workdays defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2L7	7th workdays defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2L8	8th workdays defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2S1	1st holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2S2	2nd holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2S3	3rd holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2S4	4th holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu

Label	Name	Range	Default
2S5	5th holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2S6	6th holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2S7	7th holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu
2S8	8th holiday defrost start program 2	0 ÷ 23h 50 min. - nu	nu
	OTHER		
Adr	Serial address	0÷247	1
onF	Switch off the controller	no/yES	no
rEL	Software release	- - -	6.2
Ptb	Map code	- - -	1
Prd	Probe display	- - -	